REMARKS/ARGUMENTS

The invention relates to the discovery of *Xb3*, a polynucleotide encoding XB3 (for XA21 Binding Protein 3), a protein that interacts with the XA21 kinase. *Xb3* was identified in a yeast two-hybrid assay in which a rice cDNA library was screened using the XA21 kinase as bait. The cloned *Xb3* was subsequently sequenced. Based on the nucleotide sequence, it was determined that *Xb3* encodes a 450 amino acid protein (i.e., XB3) that has a myristoylation site, 8 imperfect copies of ankyrin repeats, and a RING finger motif. Functional studies indicated that XB3 is a substrate for the XA21 serine/threonine kinase, and binds XA21 via its ankyrin repeat domain. Other studies indicated that XB3's RING finger domain ubiquitinates itself, and is required for ubiquitination of XA21. *In vivo* protein assays indicated that XA21 is rapidly degraded in response to infection with an avirulent strain of *Xoo*, but not with a virulent strain.

Application Status

Claims 1-24 were pending in the subject application. Claims 8-18 and 21-24 were withdrawn from consideration, and claims 1-7, 19, and 20 were rejected. No claims were allowed. By this amendment, claims 1, 2, 7, 19, and 20 have been revised and claims 8-18 and 21-24 have been canceled. Therefore, claims 1-7, 19 and 20 are now pending and before the examiner for consideration.

Drawings

The Draftsperson objected to the drawings submitted in this application as being informal. A formal set of drawings is submitted with this response.

Claim Objection

Claim 2 was objected to under 37 CFR §1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. While applicant does not agree with this assertion, the present amendment to claims 1 and 2 obviates the objection.

Claim Rejection Under 35 USC §101

Claim 7 was rejected under 35 U.S.C. §101 for allegedly being directed to non-statutory subject matter. Specifically, the Office Action indicated that "...the claimed

cell does not sufficiently distinguish over cells as they exist naturally because the claim does not particularly point out any non-naturally occurring differences between the claimed product and the naturally occurring products." As suggested by the examiner, claim 7 has been amended to recite "the purified nucleic acid of claim 1."

Rejection Under 35 USC §112 Second Paragraph

Claims 1-7 and 19 were rejected under 35 U.S.C. §112, second paragraph for the reasons described below.

Regarding claims 1 and 19, the Office Action indicated that:

> ... the phrase "at least one functional activity of native XB3" is indefinite because it is unclear what the metes and bounds of this phrase is. Applicant's teachings at page 3, lines 13-18 of the specification appears to define the functional activity as purified protein whose amino acid sequence is SEQ ID NO: 2, which is a physical characteristic and not a functional characteristic.

Although claims 1 and 19 have been amended to not recite the phrase "at least one functional activity of native XB3", applicant respectfully disagrees with this assertion and directs the examiner to the specification on p. 5, lines 11-14, which recites:

> A "functional activity" of a protein is any activity associated with the physiological function of the protein. For example, functional activities of XB3 include ubiquitin ligase activity, the ability to be phosphorylated by XA21, and the ability to specifically bind XA21 in at least one of the *in vitro* assays described herein.

As to claim 2, the Office Action indicated that "the phrase "high stringency conditions" was indefinite." While applicant does not agree with this assertion, the amendment to claim 2 eliminates the recitation of the phrase "high stringency conditions".

The Office Action also rejected claim 4, stating "...the designation "XA21" is indefinite because the designation appears to be arbitrary." As pointed out in the specification at page 2, lines 15-20, XA21 was a known protein at the time the application was filed. See, e.g., U.S. Patent Number 5,952,485.

Regarding claims 3 and 5-7, the Office Action alleged that these claims "were also indefinite because said claims do not obviate the indefiniteness of the claim(s) upon

which they depend." In view of the above, this rejection is no longer believed to apply. Accordingly, reconsideration of this rejection is requested.

Rejection Under 35 USC §112 First Paragraph

In the Office Action, claims 1, 2, 4-7, 19 and 20 were rejected under 35 U.S.C. §112, first paragraph as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Specifically, the Office Action indicated that:

> [a]pplicant does not describe purified nucleic acids that encode a protein that shares at least 80% sequence identity with SEQ ID NO: 2 and has at least one functional activity of native XB3, or said purified nucleic acids that hybridize under high stringency conditions to the nucleotide of SEQ ID NO: 1.

The claims have been amended to remove recitation of percent sequence identity and hybridization conditions. The present claims are believed to meet the requirements of 35 USC §112. Accordingly, withdrawl of this rejection is requested.

In the Office Action, claims 1-7, 19 and 20 were rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with it is most nearly connected, to make and/or use the invention. Specifically, the Office Action indicated that:

> [a]pplicant does not teach purified nucleic acids that encode a protein that shares at least 80% sequence identity with SEQ ID NO: 2 and has at least one functional activity of native XB3, or said purified nucleic acids that hybridize under high stringency conditions to the nucleotide of SEQ ID NO: 1. In addition, Applicant's teachings of the effect of suppressing XB3 levels in a plant appear contradictory (see pages 42 and 43 of the specification as addressed below), and hence Applicant does not teach how to use the claimed nucleic acids, vectors and cells, and does not teach a method of modulating disease resistance in a plant...
>
> ...At claims 19 and 20, Applicant's guidance is limited to a method in rice. The target substrate protein, XA21, of XB3 appears to be only present in rice and associated with a disease response in rice, and is not generally applicable to any

plant as broadly claimed. In addition, the examples Applicant provides on pages 42 arid 43 appear contradictory, because in both examples, Applicant suppressed levels of XB3 in a rice plant a produced opposite phenotypes, one being hypersensitive and one being "resistant", non-hypersensitive, to a rice pathogen (see page 42, lines 16-19, and page 43, lines 6-9 of the specification). In addition, Applicant's use of the term "resistant lines" appears to be directed to resistance to the hypersensitivity reaction induced by the pathogen, while in Applicant's earlier study cited on page 42, line 33, of the specification, Applicant defines "resistant lines", which overexpress the XA21 protein, to have the opposite meaning (see Song et al 1995, Science 270:1804-1806, especially page 1805, right column). In both examples, the levels of XB3 are taught as reduced in both the "susceptible" and the "resistant" lines. In addition, in the example in the paragraph spanning pages 41-42 of the specification, Applicant states that one transgenic plant that does not carry XA21::MYC formed spontaneous, lesions, thus if the formation of spontaneous lesions appears independent of the presence of XA21. Conversely, at page 43, lines 3-4, Applicant teaches that the resistant lines had easily detected XA21::MYC expression. The specification speculates that expression of XA21 is related to a hypersensitivity response to *Xanthomonas* pathogens, and that XB3 negatively regulates this hypersensitivity reaction by regulating XA21 activity in the rice cell (page 2, 2nd paragraph of the Remarks).

As pointed out above, the present amendment has removed recitation of percent sequence identity and hybridization in the claims. Thus, the first part of this rejection no longer applies. As to the rejection of claims 19 and 20, these claims have been amended to remove any modulating disease resistance requirement. The preamble of claim 19 now recites "a method of modifying a plant cell or seed". While the examples provided in the specification relate to rice, applicant asserts that one of skill in the art of at the time the invention was made, armed with applicant's teaching, could have introduced a nucleic acid encoding an XB3 protein into a plant cell or seed to successfully modify the cell or seed.

Conclusion

The claims currently before the examiner are supported throughout the specification and are patentable over the prior art. No new matter has been added. This application is now in full condition for allowance, and such action is respectfully requested.

This amendment is accompanied with a petition for retroactive three months extension of time and the required fee. The Commissioner is hereby authorized to charge any underpayment or credit any overpayment of fees under 37 CFR 1.16 or 1.17 as required by this paper to Deposit Account 50-0951.

The examiner is invited to call the undersigned if clarification is needed on any matter within this amendment, or if the examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

AKERMAN SENTERFITT

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